THE TOPOGRAPHY OF BRITISH INDIA.

India. By Colonel Sir Thomas Holdich, K.C.M.G., K.C.I.E., C.B., R.E. Pp. 375; 8 maps in colours. *The Regions of the World.* Edited by H. J. Mackinder. (London: Henry Frowde, Oxford University Press, n.d.) Price 7*s.* 6*d.* net.

WITH climates varying from the ice-bound deserts of the higher Himalayas and the rain-steeped forests of Tenasserim, to the desolation of Makran, where at one time of the year fire is almost unnecessary, even for cooking, and at another the cold blasts almost defy human endurance; the inhabitants of which number races unsurpassed as brave and stubborn fighters, and races among whom physical cowardice is regarded as no disgrace; where in one part music is produced by stamping on a piece of wood, and in another has been carried to a refinement which requires sixty-four tones to our octave—both extremes, it may be added, equally unmusical to the European ear; where there is found a system of laws so elaborate that the cashier who has confessed to embezzlement may yet succeed in escaping punishment, and a system of government so paternal that it imprisons the husband, whose domestic happiness has been ruined, to prevent his committing the crime of murder; the territories known as British India may be a country for political purposes, but in no proper sense of the word do they constitute a nation, they are hardly even a "region of the world," and the name is nothing but a geographical expression for the area which is administered by the British Government through the agency of the Governor-General of India in Council. To write a description which, in a book of moderate compass, will convey a clear and fairly proportioned conception, requires a master hand; not to have failed is in itself high praise, but Sir Thomas Holdich has done more than this, he has produced a topographical description of the Indian Empire which, in spite of minor errors—such as the reference to the Kasmur bund as intended for the storage of water, and a general inaccuracy where he ventures into geology—is not only interesting to read, but accurate and well proportioned on the whole.

With all its manifold diversity in detail, the Indian Empire is composed of two parts, each of which may be regarded as a geographical unit, and each geographically distinct from the other. The larger and more important of the two may be regarded as India proper, and consists of the alluvial plains of the Indo-Gangetic river system, and the triangular area known, though incorrectly, as the Peninsula. It is cut off from Burma by a tract of mountains, impassable by reason of the deep-cut network of valleys and the dense vegetation with which their slopes are covered, and on the north it is bounded by the mighty range of the Himalayas. Both these barriers have proved effective against either ethnical or military invasion, but on the west are the semi-desert hills and open plains of Afghanistan and Baluchistan, which have repeatedly been traversed by invaders. It is in the description of this region that Sir Thomas Holdich is at his best, partly, no doubt, because it is that of which he has the most intimate personal knowledge, but largely, too, because of the intrinsic interest attaching to it; for across this region came not only the great prehistoric Dravidian and the semi-historic Aryan invasions of India, but also the military invasions of Alexander the Great, and of the successive Mohammedan conquerors of India. Until the improvement of navigation brought in the nations of the west, it was the only way by which invasion and conquest were possible, and it is through this region alone that we need look for a serious attack on India, so long as we hold the command of the sea.

Of this long series of invasions all the historical ones, from Alexander onwards, have been purely military; they have left their impress, more or less deeply marked, on the religion, the administration and the political geography of India, in buildings and in public works, but they have hardly affected the great bulk of the people, who derive their origin from the earlier invasions. In these it was no mere conquering army that came, but nations, with their wives and families, their flocks and herds, their household goods and gods, who absorbed or exterminated the inhabitants of the land, and whose descendants are found over the length and breadth of India, constituting nine-tenths of the total population.

The other unit in the Indian Empire is Burma, which belongs, geographically, rather to Indo-China than to India. Cut off from the latter by a band of forest-clad mountains, which has rarely been traversed even by marauding expeditions, it received centuries ago its religion and philosophy from India, but has remained unaffected in all other respects, and maintained its ethnical distinction untouched. This isolation of Burma is now at an end; the establishment of steamer lines across the Bay of Bengal has rendered it easy of access, the Hindu prejudice against crossing the sea has given way to the stronger claims of pecuniary gain, and the gay, picturesque, pleasure-loving Burman, who had evolved an epicurean philosophy and regarded life merely as something to be enjoyed, is being ousted by the plodding, but joyless and unattractive native of Behar or Madras.

Across the north of the Empire runs the great mountain barrier of the Himalayas, the highest and greatest mountain range of the world, which separates the Mongolians of Thibet from the races of India, and has left its impress on their mythology and folk-lore. This naturally gets a chapter to itself, and it is satisfactory that the author recognises the futility of an attempt to trace any limited number of continuous chains in a mountain range of so great an extent, and wisely abstains from formulating any theory of the Himalayas. We cannot, however, accept the statement, repeated more than once, that the eastern Himalayas are older than the western; it is true that the rocks of which they are composed are older, but the rise of the Himalayas, as a mountain range, belongs to the great period of mountain formation which commenced at the close of the Secondary era, and there is no reason for supposing that the two halves of the range differ materially in the age of their elevation.

The book is provided with a large number of blocks in the text, nearly all maps, in which, with very few exceptions, but one method of representing relief is adopted—that of shaded areas bounded by contour lines. The method is valuable for some purposes, but as a means of representing the form of the ground is, in most cases, inferior to the much abused "caterpillar" method of delineation, and frequently conveys a misleading impression. The figure intended to represent the lower Brahmaputra valley and Gangetic delta is an instance of this, while that intended to represent the orography of the Hindu Kush looks more like an ink-maker's advertisement. In the coloured maps the complete absence of hill shading gives to the Thibetan plateau an air of flatness which it is far from possessing in reality, yet it would be unfair to conclude this notice without a word in their praise. Mr. Bartholomew has accustomed us to a high standard of workmanship, but his map of India, reproduced in this book, has seldom been equalled for intricacy and accuracy of colour printing, and for success in showing the leading features of the relief of the land.

PHYSICAL AND PHYSIOLOGICAL ASPECTS OF LIGHT.

Light Energy; its Physics, Physiological Action, and Therapeutics. By Margaret A. Cleaves, M.D. Pp. xiv+827. (London: Rebman, Ltd., 1904.) Price 21*s.* net.

WHILE this book is written primarily to further our knowledge of the properties and uses of that form of energy called light, in the treatment of disease, yet it will be found of great interest to those whose study is mainly confined to the purely physical aspects of light phenomena. The subject is treated from the modern view of energy in the form of waves of a certain length and direction, but at the same time the emission theory is not entirely ignored on account of the peculiar behaviour of some of the recently discovered radio-active substances, notably radium. About 130 pages are devoted to a description of the various kinds of rays, their origin and physical properties. The part dealing with the electric arc is very complete and clear, and embraces all one could wish to know to ensure an intelligent application of the arc lamp in the treatment of disease.

Following this is a series of chapters dealing with the action of light on the various forms of life, from the most elementary to the highly complex human subject. In this section the action of light from both natural and artificial sources is treated very thoroughly. It is quite evident that the author has devoted herself to a large amount of painstaking experiment, the valuable results of which are recorded in the present volume. According to her, the mercury vapour lamp has not justified the expectations regarding it as a therapeutic agent.

The second half of the book is taken up with the therapeutic applications of the various forms of light. This part will be of special interest to medical men, especially those who are engaged in this line of work. Sun, arc, and incandescent light baths are treated most fully, together with their use in those diseases in which the author has found them respectively useful. The indications are, in every instance, based on spectroscopic analysis, and full details of the proper technique are given for every variety of application. Several forms of bath cabinet are described, as well as arc and other lamps for local treatment with concentrated light.

While the author is rather emphatic on the necessity for employing lamps of large amperage—quantity being as essential as quality—yet she speaks highly of certain small lamps the efficiency of which was such as to necessitate their replacement by lamps of greater power in the light department of the London Hospital. The reason for this praise is seen, later on, to be related to the comparative cost of the lamps—the smaller being sold and maintained at a fraction of the cost of the Finsen, and their efficiency is at least in proportion to this cost. According to the author, the great advantage of a lamp of high amperage, like the Finsen, is that we get not only the short and high frequencies of intense chemical activity, but also the frequencies of long wave-lengths having great amplitude and penetrability—a combination which is essential to ensure the best success. In the smaller lamps these long wave-lengths of great amplitude are not present in such abundance because of the lesser amperage and smaller carbons. The results which the author has obtained in many diseases not generally subjected to light treatment will come as a surprise to those who have not kept closely in touch with modern light therapeutics.

The applications of the various coloured lights, as also those of the invisible spectrum rays, are fully discussed. A short chapter is given to the consideration of *n*-Rays and one to the Alpha, Beta, and Gamma rays of radio-active substances, their physical properties, actions, and therapeutic uses. An interesting chapter is that on fluorescence, fluorescent stimulation, and sensitisation of tissues, and the book closes with a chapter on the pernicious effect of sunlight and the pathological effects of electric lighting. The book can be confidently recommended. It will be found of great interest to most students of natural science.

REGINALD MORTON.

A BOOK ON INK.

Inks: their Composition and Manufacture. By C. Ainsworth Mitchell, B.A. (Oxon.), F.I.C., and T. C. Hepworth. Pp. xiv+251; with 46 illustrations, including 4 plates. (London: Chas. Griffin and Co., Ltd., 1904.) Price 7*s.* 6*d.* net.

LITERA scripta manet; but the permanence of the writing depends upon the quality of the ink. Certain papyri of ancient Egypt, now deposited in the British Museum, contain the earliest ink-written records so far brought to light. A roll dating from 2500 B.C. still bears decipherable characters, and fragments of papyri have been found by Prof. Flinders Petrie in a tomb to which the date 3500 B.C. is ascribed. If the origin of the use of ink is lost in antiquity, at